Waller Creek Restoration & Rehabilitation Project

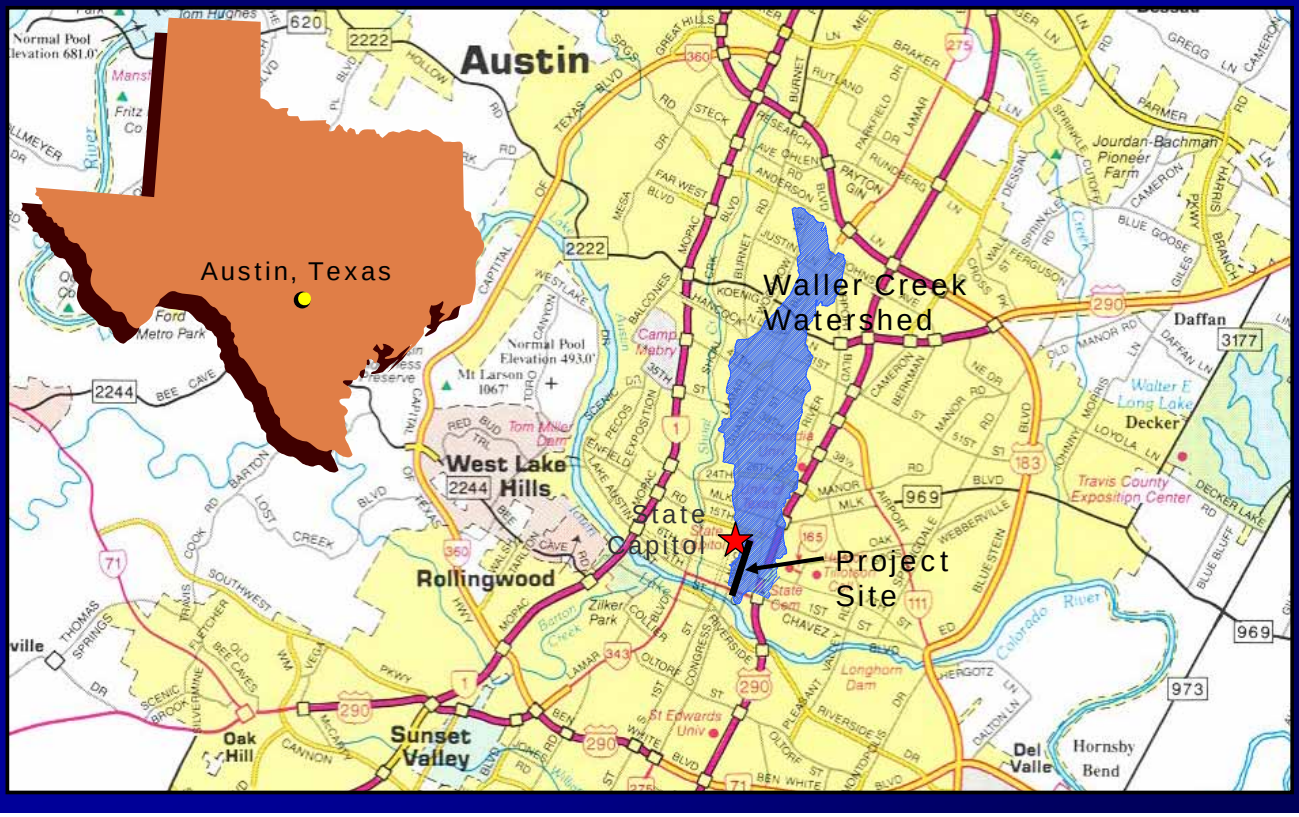
An Environmentally Responsive / Green Project




Kellogg Brown & Root Services, Inc.
Espey Consultants, Inc.

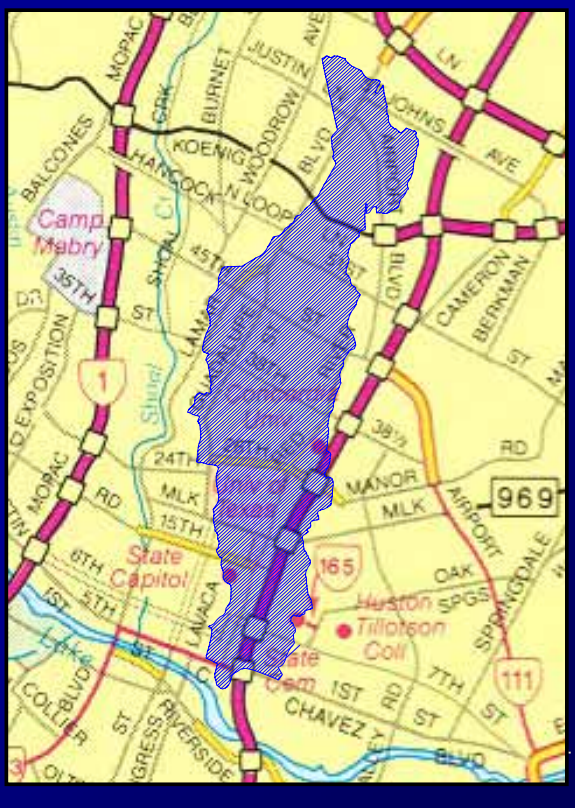
Accurate CAD & Technical Services, Inc.
All Points Inspection Services, Inc.
Baer Engineering & Environmental Consulting Services, Inc.
Brown & Gay Engineers, Inc.
CAS Consulting & Services, Inc.
Crespo Consulting Services, inc.
Encotech Engineering Consultants, Inc.
Graeber, Simmons & Cowan, Inc.
Group Solutions RJW
Harutunian Engineering, Inc.
Holt Engineering, Inc.
HVJ Associates, Inc.
Jaster-Quintanilla & Associates, Inc.
Jenny Engineering Corporation
MWM Design Group
McGray & McGray Land Surveyors, Inc.
Texas Star Document Services
Vickrey & Associates, Inc.
Winterowd Associates, Inc.

Project Location



Waller Creek Watershed

- Drainage Area = 3,700 acres (5.74 sq mi)
- Fully Developed with >50% Impervious Cover
- Water Quality: Lower than 70% of Austin-area Streams
- 43 Erosion Problem Sites identified in 2002



Existing Erosion Conditions

Flood History

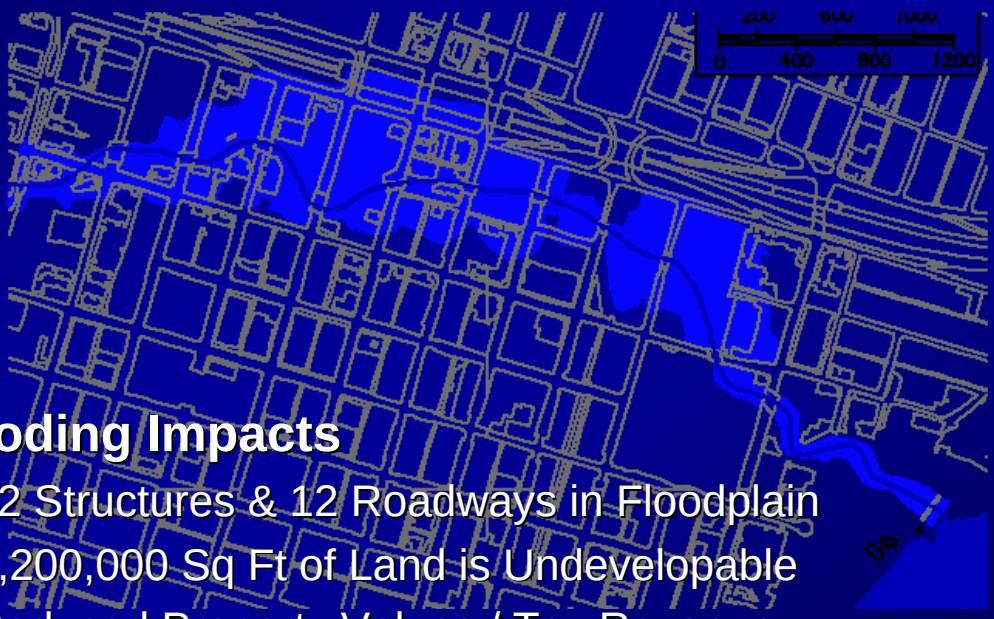
THEORETICAL STORM

- 100-year
  - 1% chance of occurrence in any given year
  - 10.2 inches in 24 hours (Travis County)

HISTORICAL FLOODS

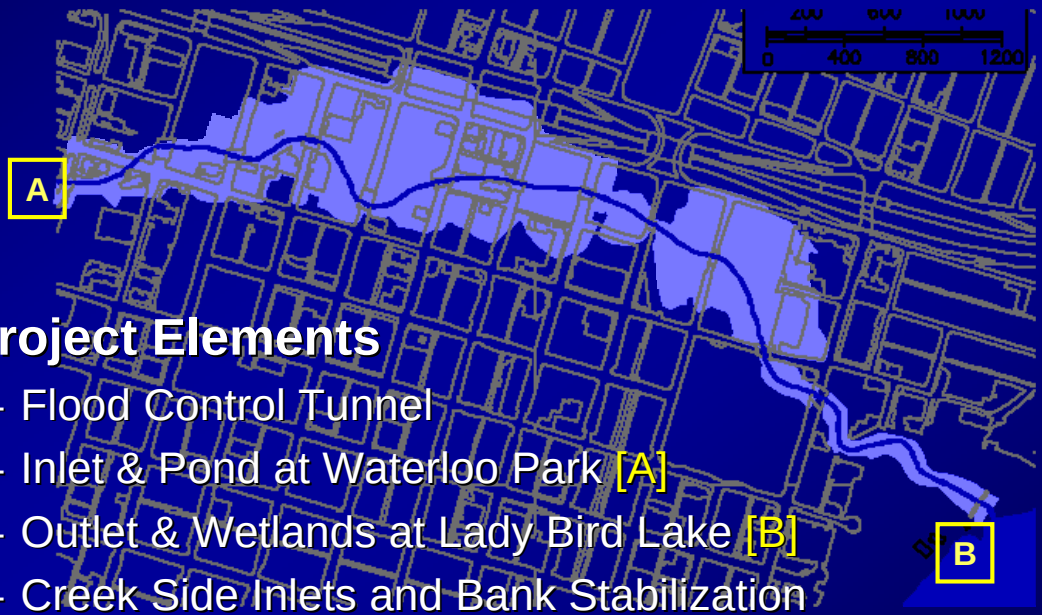
- 1915
  - 10 inches in 24 hours
- 1921
  - 13.75 inches in 12 hours
- 1981 Memorial Day flood (Shoal Creek)
  - 10 inches in 4 hours

Existing Floodplain Conditions



- **Flooding Impacts**
  - 42 Structures & 12 Roadways in Floodplain
  - 1,200,000 Sq Ft of Land is Undevelopable
  - Reduced Property Values / Tax Revenue

Proposed Solution

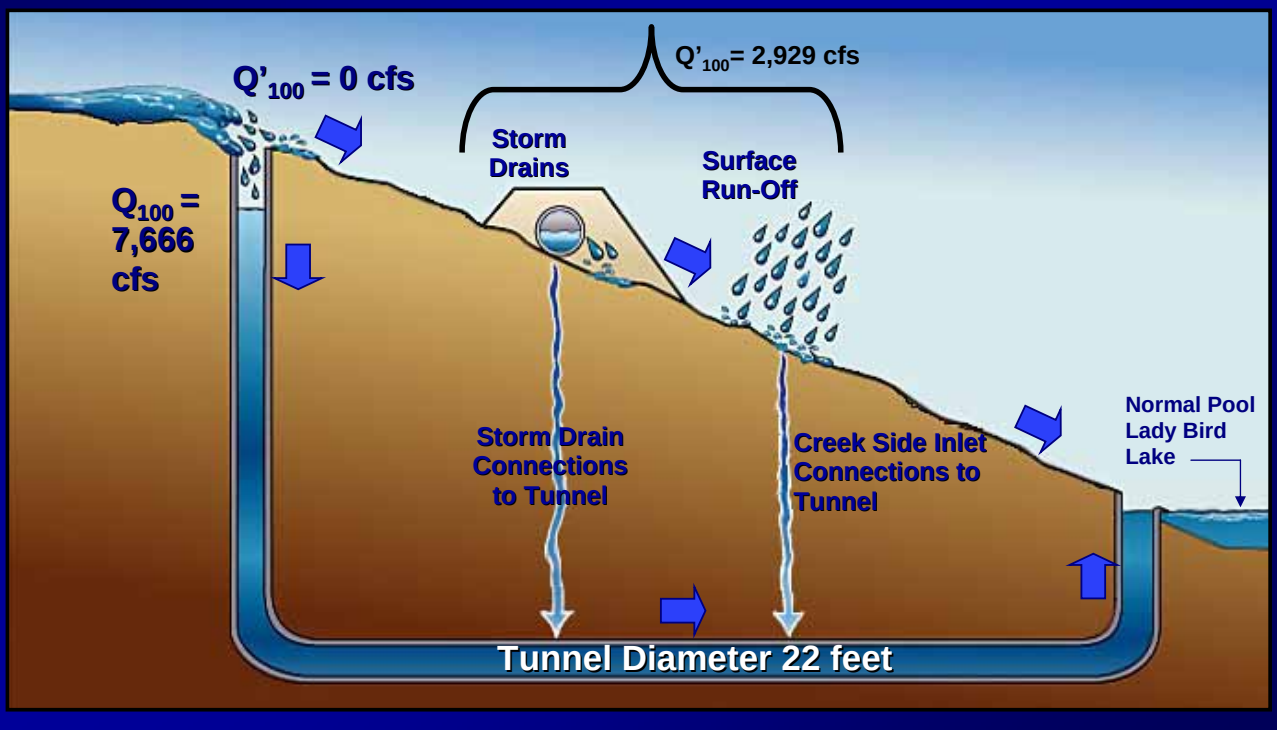


- **Project Elements**
  - Flood Control Tunnel
  - Inlet & Pond at Waterloo Park [A]
  - Outlet & Wetlands at Lady Bird Lake [B]
  - Creek Side Inlets and Bank Stabilization
  - Tunnel/Creek Recirculation System

Tunnel Structure

- Dimensions
  - Approximately 5,400 feet in length
  - Average diameter of 22 feet
  - 60-70 feet underground
- Surface features
  - Inlet at Waterloo Park
  - Outlet at Lady Bird Lake
  - Creek Side Tunnel Inlets
  - Creek recirculation

Tunnel Profile



Design Criteria

- Engineering Requirements
  - Hydraulic function
  - Health and safety
  - Minimize impacts / optimize benefits
- Environmental / Sustainability Considerations
  - Minimize Parkland Impacts
  - Protect / Preserve Natural Features (exposed limestone creekbed, riparian habitat, natural vegetation, etc.)
  - Identify Creek Restoration Opportunities

Inlet
(Waterloo Park)

Inlet Components

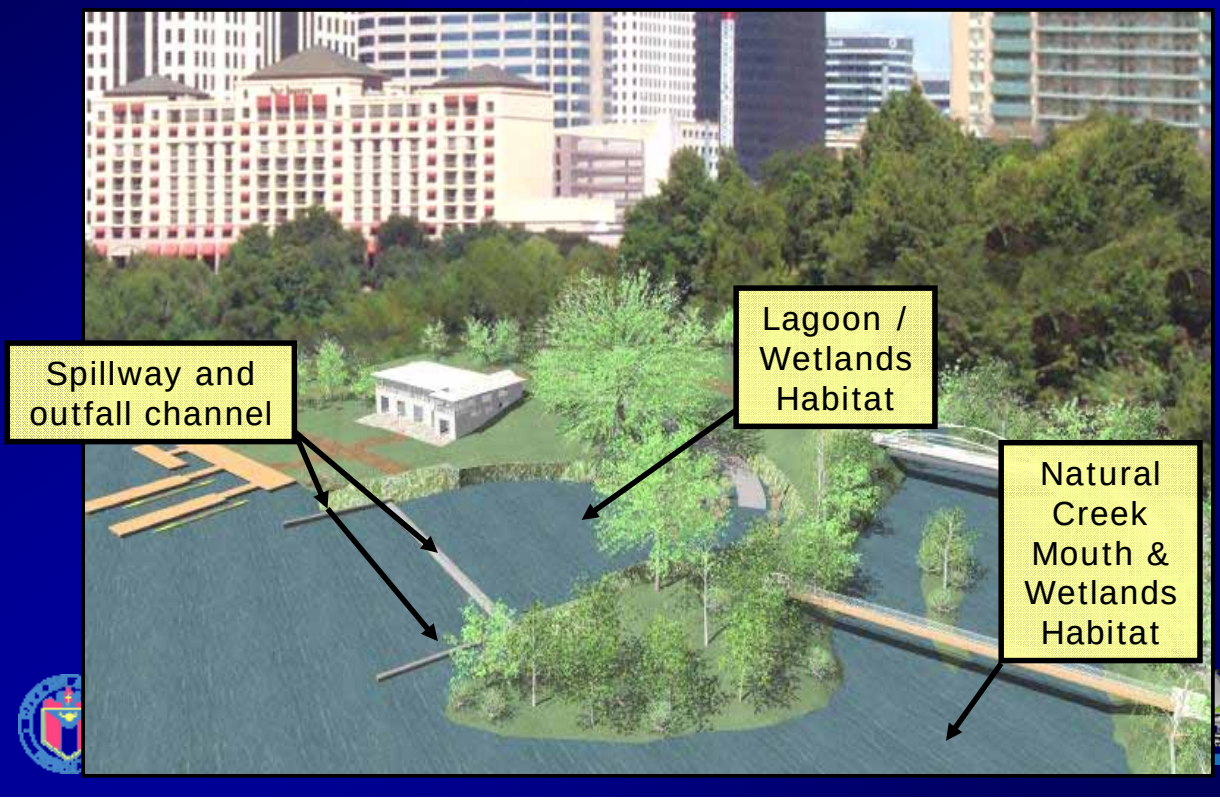
- Creek Restoration
  - Approach channel
  - Lagoon / Wet Pond
- Water Quality
  - Debris screening & removal
  - Recirculation System
- Morning Glory Spillway
- In-channel Dam
- Minimal Impacts to Parkland

Outlet
(Lady Bird Lake)

Outlet Components

- Preserve Natural Creek Mouth & Wetlands Habitat at Lady Bird Lake
- Maintain Natural Shoreline
- New Lagoon / Wetlands Habitat
- Spillway & outfall channel

Environmental Outlet Rendering



Creek Side Tunnel Inlets

Creek Side Tunnel Inlets

- Site Selection
  - Minimal impact to valuable natural features
    - Exposed geologic formations
    - Trees and natural vegetation
    - Potential riparian habitats
    - Historical structures
  - Maximum potential for creek restoration
    - Existing man-made infrastructure within banks
    - Heavily eroded areas in need of rehabilitation
  - Maximum floodplain reduction potential

Creek Side Tunnel Inlets

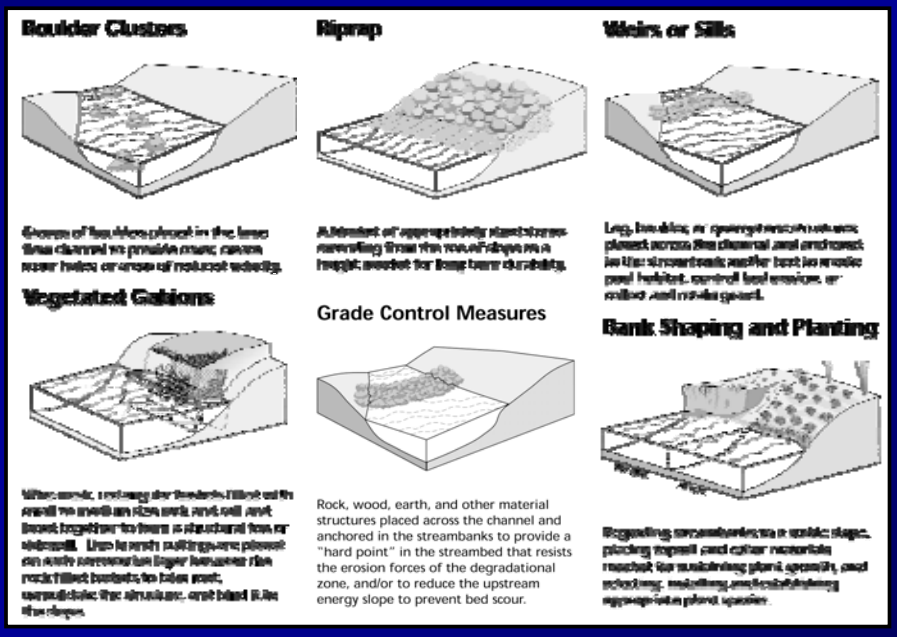
Existing Conditions

Creek Side Tunnel Inlets

Existing Conditions

Creek Restoration

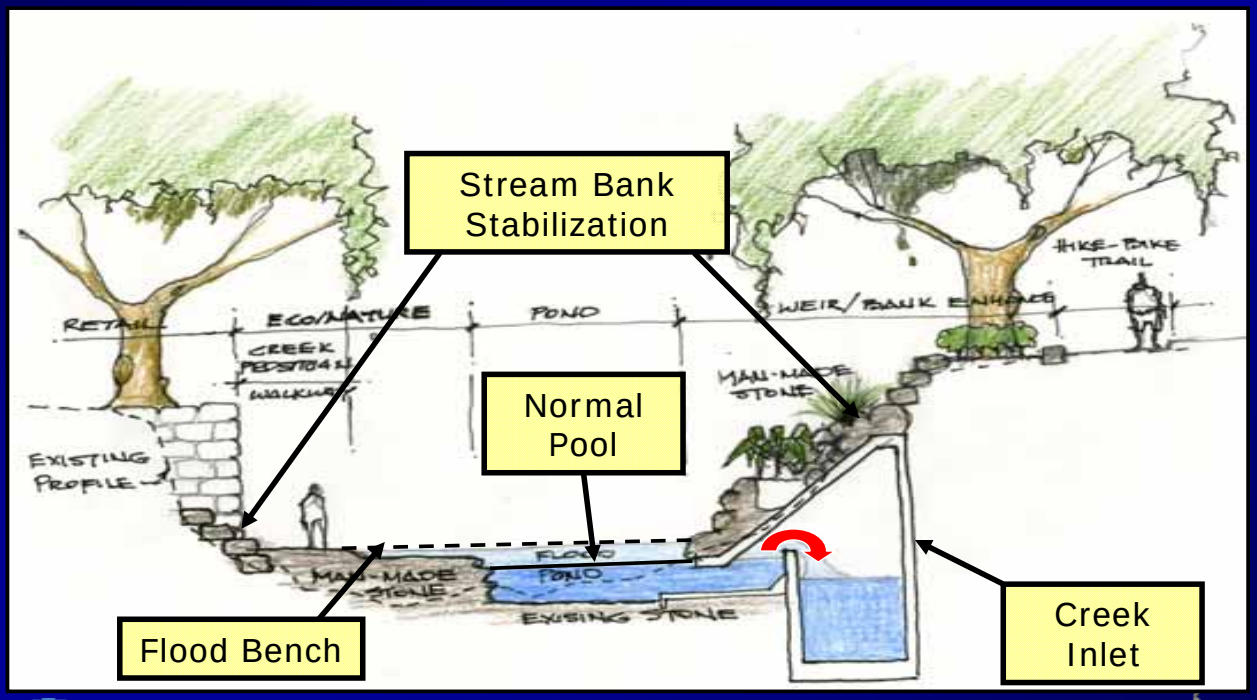
- Design Considerations



Creek Restoration

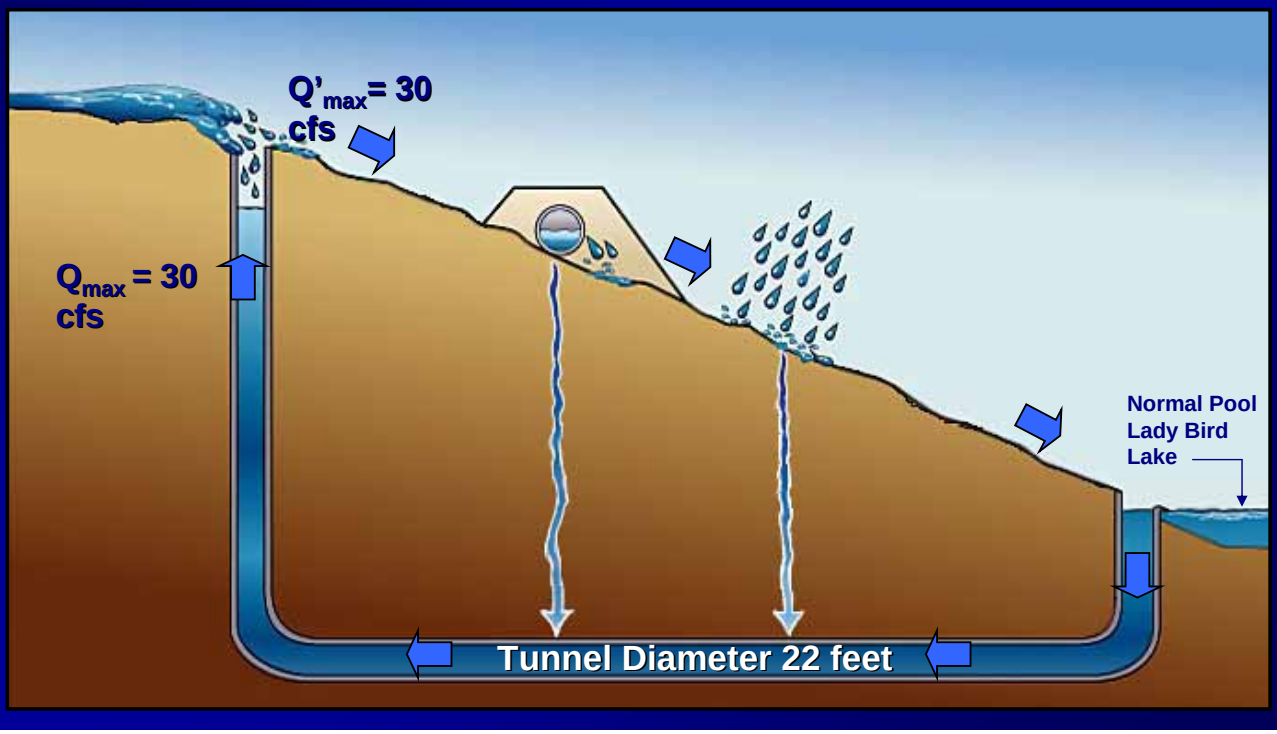
- Design Considerations

Creek Side Inlet Components



Environmental
Creek Side Inlet Rendering

Tunnel Recirculation



Tunnel Recirculation

- Water Quality Benefits
  - Keep Tunnel Contents Fresh
  - Keep Pool Contents Fresh
  - Maintain Flow in Waller Creek
  - Makeup Water for Water Features
- Required Rate
  - Dry Weather - 10 cfs to maintain 3+ mg/L DO
  - Post Storm - 30 cfs to maintain 2+ mg/L DO
- Recirculation Debris Screening
  - Openings - 1 1/4 inch

Project Benefits

- Reduction of 100-year floodplain
  - Over 1,000,000 square feet of land reclaimed
  - 42 structures & 12 roadways reclaimed
- Reduce risk of severe flooding and erosion
- Stabilize and restore creek bed and banks
- Substantial reduction of debris and pollutants
  - Reduction of debris and constant water flow will improve overall water quality and conditions for plants and wildlife
- Allow great opportunities for redevelopment and amenities along the creek, such as hike and bike trails
- Natural channel design
- Educational opportunities